JC14 Rec'd PCT/PTO 0 7 DEC 2001

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEY'S DOCKET NUMBER WPT0005

U.S. APPLICATION NO (IF KNOWN)

				<u> </u>
INT		IONAL APPLICATION NO. PCT/GB00/02251	INTERNATIONAL FILING DATE 9 June 2000	PRIORITY DATE CLAIMED 10 June 1999
		NVENTION TUS INSTRUMENT AND I	DEVICE FOR CONDUCTING AN AS	SAY
		T(S) FOR DO/EO/US REWES, et al.		N. N
Appl	licant he mation:	erewith semits to the U.S. D	Designated/Elected Office (DO/EO/US) th	ne following items and other
1.	\boxtimes	This is a FIRST submission	on of items concerning a filing under 35 L	J.S.C. 371.
2.			SEQUENT submission of items concern	
3.		This is an express request	to begin national examination procedure til the expiration of the applicable time lin	es (35 U.S.C. 371(f) at any time rather
4.		A proper Demand for Interrearliest claimed priority date	national Preliminary Examination was ma te.	ade by the 19 th month from the
5.	\boxtimes	A copy of the International	Application as filed (35 U.S.C. 371(c)(2)).
		b. 🛛 has been transm	rewith (required only if not transmitted by nitted by the International Bureau. as the application was filed in the United S	
6.		· ·	tional Application into English (35 U.S.C.	= ' '
7	. 🔲		of the International Application under PC	
			erewith (required only if not transmitted t	
•	•		nitted by the International Bureau.	
			ade; however, the time limit for making s	uch amendments has NOT expired.
8.	П		ade and will not be made.	(0511000074/-)/0))
			nents to the claims under PCT Article 19	, , , , , ,
9.	\boxtimes		e inventor(s) (35 U.S.C. 371(c)(4)) (unsig	-
10.		A translation of the annexes (35 U.S.C. 371(c)(5)).	s to the International Preliminary Examin	ation Report under PCT Article 36
Items	; 11 to 1	16 below concern document(s) or information included:	
11.	X	PCT Search Report and Int	ernational Preliminary Examination Repo	ort.
12.		An assignment document for	or recording. A separate cover sheet is i	ncluded.
13.	\boxtimes	A FIRST preliminary amend	iment.	
14.		A substitute specification.		
15.		A change of power or attorn	ney and/or address letter.	
16.	\boxtimes	Other items or information		
		Certificate of Mailing by Exp Check for \$1,224.00.	oress Mail and Return Card; IDS, Form 1	449 and copies of references;

JC13 Rec'd PCT/PTO 0 7 DEC 2001

APPLICATION NO. (IF KI		ION NO. (If kno	own)	ATTORNEY'S WPT						
17. 🛛 The followi	entity)	CALCULATIONS	3							
BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(5)										
Search Report has been prepared by the EPO or JPO\$ International preliminary examination fee paid to USPTO										
(37 CFR 1.482)			\$							
No international pre	liminary examination fee paid international search fee paid									
(37 CFR 1.445(a)(2)	(37 CFR 1.482) but international search fee paid (37 CFR 1.445(a)(2)) paid to USPTO\$ Neither international preliminary examination fee (37 CFR 1.482)									
nor international sea										
International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4) \$										
ENTE	ENTER APPROPRIATE FEE AMOUNT = \$1040.00									
Surcharge of \$130.0 30 ⊠ months from	\$ 130.00									
CLAIMS	NUMBER FILED		RATE							
Total Claims	23 - 20 =	3	x\$ 18.00	\$54.00						
Independent Claims	2 - 3 =	0	x \$ 84.00	\$0						
			+ \$280.00	\$0 \$1,224.00						
	TOTAL OF ABOVE CA	LCULATIONS	5 =							
Reduction by ½ for filing by must also be filed (Note 37	/ small entity, if applicable. Ve CFR 1.9, 1.27, 1.28)	erified Small Entit	y Statement	\$.00						
		SUB	STOTAL =	\$0						
Processing fee of \$130.00 months from the earliest cla	for furnishing the English tran aimed priority date (37 CFR 1	slation later than .492(f)).	20 🗌 30 🗌	\$0						
	то	TAL NATION	AL FEE =	\$0						
Fee for recording the enclo	sed assignment (37 CFR 1.2	1(h)). The assigni	ment must be	+						
accompanied by an approp	oriate cover sheet (37 CFR 3.2	28, 3.31) \$40.00 p	per property +	\$0						
	ТО	TAL NATION	AL FEE =	\$1,224.00						
				Amount to be: refunded	\$					
				charged	\$					
	he amount of \$1,224.00 to co									
	ge my Deposit Account No									
overpaymer	ssioner is hereby authorized t nt to Deposit Account No. 50-	1123.								
NOTE: Where an appropri or (b) must be filed and gra	iate time limit under 37 CFR 1 anted to restore the application	.494 or 1.495 has n to pending statu	s not been met, is.	a petition to revive (37 CFR 1.137(a)					
SEND ALL CORRESPON	DENCE TO:			4						
Corol W. BURTON For			En	e B						
Carol W. BURTON, Esq. Hogan & Hartson, L.L.P. SIGNATURE										
One Tabor Center Suite 1500 1200 Sevent	teenth Street		Eugene J. Berr							
Denver, Colorado 80202	2			0						
			reg. No. 42,32	0						

Attorney Docket No. WPT0005 Client Matter No. 80469.0005

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE UNDER THE PATENT COOPERATION TREATY

In re Application of:

David ANDREWES, et al.

Serial No. Unassigned

Filed: December 7, 2001

For: MIXING APPARATUS AND METHOD OF

MIXING DURING CONDUCTING AN

ASSAY

Examiner: Unassigned

Art Unit: Unassigned

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents 2900 Crystal Drive Arlington, VA 22202-3513

Sir:

Please amend the copy of PCT Patent Publication No. WO 00/76663 A1, filed herewith, as follows:

IN THE CLAIMS

Please amend claims 1-23 according to the attached sheets.

Please cancel claim 24 without prejudice to the subject matter contained therein.

REMARKS

The amendment cancels claim 24, making claims 1–23 pending in the application. The amendment removes the multiple dependent claim format and reference numbers in the claims, and was not made to overcome any prior art references. Support for the amendment can be found in the claims. No new matter has been added by the amendment.

Please consider the pending claims in light of the references cited in the enclosed Information Disclosure Statement. These references were cited in the PCT International Search Report, a copy of which is enclosed for your convenience.

L ()

\\DE - 80469/3 - #136022 v1

Applicants enclose herewith the fee for filing a continuation application and believe this to be the only fee required for this amendment and response. Should any additional fees be required, please charge Deposit Account 50-1123.

Respectfully submitted,

December 7, 2001

Eugene J. Bernard, Reg. No. 42,320 HOGAN & HARTSON LLP

HOGAN & HARTSON LLP 1200 17th Street, Suite 1500 Denver, Colorado 80202 Telephone: (303) 454-2457

Facsimile: (303) 899-7333

MARKED-UP VERSION OF THE CLAIMS

- 1. An apparatus [10,] for use in an assay in which a sample is presented to an instrument, comprising a first inlet [12], a second inlet [14] and an inlet port [16], said inlet port being movable relative to each of said first and second inlets such that the inlet port can be brought into liquid communication with each inlet in turn as required, said inlet port accommodating a filter means or a binder retaining means 18 characterised in that said inlet port is brought into liquid communication with each inlet in turn along a linear path.
 - 2. An apparatus as claimed in claim 1 which is a cartridge.
- 3. An apparatus as claimed in claim 1 [or 2] comprising a first component [20] including the at least first and second inlets [12, 14], which are or include optical chambers; a second component [30] or components [40, 50] comprising a sample receiving chamber [44] and at least one other chamber [46], said at least one other chamber containing an eluting medium; and a third component [60] comprising said inlet port [16].
- 4. An apparatus as claimed in claim 3 wherein said third component is slidably disposed below the sample receiving chamber in said second component and above the optical chambers in the first component.
- 5. An apparatus as claimed in claim 3 [or 4] in which the third component seals the sample receiving chamber of the second component so that liquids stored or pre-loaded into the chamber are only released when the inlet ports formed therein are aligned with the optical chambers in the first component.
- An apparatus as claimed in claim 5 further comprising additional sealing means.
- 7. An apparatus as claimed in [any of] claim[s] 3 [to 6] in which the third component is provided with a handle or other means by which it can be moved.

- 8. An apparatus as claimed in [any of] claim[s] 3 [to 7] in which the second component comprises a resilient component and a cover.
- 9. An apparatus as claimed in claim 8, in which the resilient component comprises a plug closure.
- 10. An apparatus as claimed in [any of] claim[s] 3 [to 9] in which the second component comprises a channel within which the third component slides.
- 11. An apparatus as claimed in [any of the preceding] claim[s] 1 further comprising locator lugs to ensure correct orientation in a measuring instrument.
- 12. An apparatus as claimed in [any of] claim[s] 3 [to 11] further comprising a plurality of fins projecting from the first component.
- 13. An apparatus as claimed in [any of the preceding] claim[s] <u>3</u> in which the optical chambers are curved.
- 14. An apparatus as claimed in [any of the preceding] claim[s] $\underline{1}$ comprising air relief tubes.
- 15. An apparatus as claimed in [any of] claim[s] 3 [to 14] wherein the first component is made of a clear material.
- 16. An apparatus as claimed in [any of] claim[s] 3 [to 16] in which the second component comprises two parts, a resilient component and a cover.
- 17. An apparatus as claimed in [any of] claim[s] 3 [to 16] wherein the resilient component comprises an elongate channel into which the third component is slidably mounted.
- 18. An apparatus as claimed in claim 14 wherein each air relief tube co-operates with an aperture in the slide such that when the inlet port is correctly aligned with each chamber the aperture is aligned with the

associated air relief tube thereby causing an air lock to break thus causing release of the chamber contents through the filter into the inlet there below.

. 🤇

,

- 19. An apparatus as claimed in [any of] claim[s] 3 [to 18] wherein the first component comprises windows which are inset from the main apparatus surface.
- 20. An apparatus as claimed in [any of] claim[s] 3 [to 19] wherein the second component is "I" shaped in cross section.
- 21. An apparatus as claimed in [any of the preceding] claim[s] 1 wherein the apparatus has a toothed surface which teeth provide a means by which the apparatus can be caused to move along a track of a reading instrument.
- 22. An instrument for reading a sample presented in an apparatus, comprising a microprocessor operable via a key pad, one or more light emitters and one or more light detectors, a display and driver, an analogue to digital converter, and means for connecting the instrument to a power source, characterised in that the instrument comprises an elongate track adapted to bring an apparatus into a reading position.
- 23. An instrument as claimed in claim 22 further comprising a filter for selecting a suitable wavelength.

\\\DE - 80469/3 - #136022 v1

CLEAN VERSION OF THE CLAIMS

- 1. An apparatus for use in an assay in which a sample is presented to an instrument, comprising a first inlet, a second inlet and an inlet port, said inlet port being movable relative to each of said first and second inlets such that the inlet port can be brought into liquid communication with each inlet in turn as required, said inlet port accommodating a filter means or a binder retaining means characterized in that said inlet port is brought into liquid communication with each inlet in turn along a linear path.
 - 2. An apparatus as claimed in claim 1 which is a cartridge.
- 3. An apparatus as claimed in claim 1 comprising a first component including the at least first and second inlets which include optical chambers; a second component or components comprising a sample receiving chamber and at least one other chamber, said at least one other chamber containing an eluting medium; and a third component comprising said inlet port.
- 4. An apparatus as claimed in claim 3 wherein said third component is slidably disposed below the sample receiving chamber in said second component and above the optical chambers in the first component.
- 5. An apparatus as claimed in claim 3 in which the third component seals the sample receiving chamber of the second component so that liquids stored or pre-loaded into the chamber are only released when the inlet ports formed therein are aligned with the optical chambers in the first component.
- 6. An apparatus as claimed in claim 5 further comprising additional sealing means.
- 7. An apparatus as claimed in claim 3 in which the third component is provided with a handle or other means by which it can be moved.
- 8. An apparatus as claimed in claim 3 in which the second component comprises a resilient component and a cover.

ATM SET OF LAND OF SET

- 9. An apparatus as claimed in claim 8, in which the resilient component comprises a plug closure.
- 10. An apparatus as claimed claim 3 in which the second component comprises a channel within which the third component slides.
- 11. An apparatus as claimed in claim 1 further comprising locator lugs to ensure correct orientation in a measuring instrument.
- 12. An apparatus as claimed in claim 3 comprising a plurality of fins projecting from the first component.
- 13. An apparatus as claimed in claim 3, in which the optical chambers are curved.
 - 14. An apparatus as claimed in claim 3, comprising air relief tubes.
- 15. An apparatus as claimed claim 3, wherein the first component is made of a clear material.
- 16. An apparatus as claimed in claim 3 in which the second component comprises two parts, a resilient component and a cover.
- 17. An apparatus as claimed in claim 3, wherein the resilient component comprises an elongate channel into which the third component is slidably mounted.
- 18. An apparatus as claimed in claim 14 wherein each air relief tube co-operates with an aperture in the slide such that when the inlet port is correctly aligned with each chamber the aperture is aligned with the associated air relief tube thereby causing an air lock to break thus causing release of the chamber contents through the filter into the inlet there below.
- 19. An apparatus as claimed in claim 3, wherein the first component comprises windows which are inset from the main apparatus surface.
- 20. An apparatus as claimed in claim 3, wherein the second component is "I" shaped in cross section.

- 21. An apparatus as claimed in claim 1 wherein the apparatus has a toothed surface which teeth provide a means by which the apparatus can be caused to move along a track of a reading instrument.
- 22. An instrument for reading a sample presented in an apparatus, comprising a microprocessor operable via a key pad, a least one light emitter and at lest one light detector, a display and driver, an analogue to digital converter, and a means for connecting the instrument to a power source, characterized in that the instrument comprises an elongate track adapted. to bring an apparatus into a reading position.
- 23. An instrument as claimed in claim 22 further comprising a filter for selecting a suitable, wavelength.

WO 00/76663

10/009278 PCT/GB00/02251

-1-

DESCRIPTION

APPARATUS, INSTRUMENT & DEVICE FOR

CONDUCTING AN ASSAY

The present invention relates to an apparatus, instrument and device for conducting an assay. More particularly is relates to a device suitable for use in assaying analyses, for example glycated protein, in a sample, such as for example, blood.

The applicant has devised an apparatus, instrument and device for conducting an assay as disclosed in PCT/GB98/033586. The apparatus comprises a first inlet, a second inlet, and an inlet port, said inlet port being movable relative to each of said first and second inlets such that the inlet port can be brought into liquid communication with each inlet in turn as required, said inlet port accommodating a filter means or a binder retaining means.

In use a sample is separated into a first component fraction and a second component fraction and the component fractions are assayed to determine the presence of one or more analyses in said sample fractions.

The component fractions are read in an instrument comprising a microprocessor operable via a keypad, one or more light emitters and one or more light detectors, a display and driver, an analogue to digital converter and means for connecting the instrument to a power source.

The apparatus takes the form of a carousel. It comprises a base portion having a plurality of chambers including first and second inlets, and a top portion which together with the base portion forms the carousel. A funnel portion comprising an inlet port is in

liquid communication with said inlets.

In use the assay reagents are opened and added sequentially by the user such as a doctor or patient.

It would be desirable to provide an apparatus, instrument and device for conducting an assay which is simpler to use and is less prone to user error. It would also be advantageous if such an apparatus could be produced cheaply.

According to a first aspect of the present invention there is provided an apparatus, for use in an assay in which a sample is presented to an instrument, comprising a first inlet, a second inlet and an inlet port, said inlet port being movable relative to each of said first and second inlets such that the inlet port can be brought into liquid communication with each inlet in turn as required, said inlet port accommodating a filter means or a binder retaining means characterised in that said inlet port is brought into liquid communication with each inlet in turn along a linear path.

Preferably the apparatus takes the from of a cartridge.

Preferably the cartridge comprises a first component including the at least first and second inlets, which are or include optical chambers; a second component or components comprising a sample receiving chamber and at least one other chamber, said at least one other chamber containing an eluting medium; and a third component comprising said inlet port. Said third component is slidably disposed below the receiving chambers in said first component and above the optical chambers in the second component.

Preferably the third component forms a seal between the chamber of the second

component so that liquids stored or pre-loaded into the chambers are only released when the inlet port formed therein is aligned with the chambers. Alignment is achieved by sliding the third component along a linear path. Additional sealing means could, however, be deployed to prevent leakage.

Preferably the third component is provided with a handle or other means by which the component can be moved.

Preferably the apparatus is manufactured in a manner enabling easy filling of the chambers. Thus it is preferred that the second component comprises a resilient component and a cover. Preferably the resilient component comprises a plug closure.

To assemble and fill the apparatus the various components are assembled as follows:

- The resilient component comprising, for example, three chambers is placed in the cover,
 - 2. The plug closure pivots into place,
- 3. The assay liquids are poured into the 1st chamber, 2nd chamber and 3rd chamber,
- 4. The filter and/or binding means is located in the inlet port of the 3rd component and this is slid into the 2nd component,
- 5. The 1st component, including the 1st and 2nd inlets comprising optical chambers, is clipped into place, thus forming the cartridge.

Preferably the second component comprises a channel within which the 3rd

agarina kirangan di bertagan di lebah-kirangan kirangan angan angan Garangan berangan beranggan barangan a

-4-

component slides.

The easier it is to use a product the more acceptable it is. By following a linear path the sequence of operations can be simplified to:

- 1. Unpack the cartridge;
- 2. Rest the cartridge on a surface and pull open the closure;
- 3. Take, for example, a blood sample using a loop;
- 4. Place the blood sample into the open chamber;
- 5. Replace the plug closure;
- 6. Shake the cartridge;
- 7. Insert the cartridge into an instrument.

The cartridge is designed to be inserted into the instrument in one orientation and is provided with locator lugs to ensure correct orientation.

According to a further aspect of the present invention there is provided an instrument, for reading a sample presented in an apparatus, comprising a microprocessor operable via a key pad, one or more light emitters and one or more light detectors, a display and driver, an analogue to digital converter, and means for connecting the instrument to a power source, characterised in that the instrument comprises an elongate track adapted to bring an apparatus into a reading position.

Preferably the instrument includes a filter for selecting a suitable wavelength.

According to yet a further aspect of the present invention there is provided a device comprising an apparatus and instrument of the invention.

The next series of steps are operated from the instrument. The instrument is designed such that at the completion of the testing the cartridge cannot be removed until returned to the start position. This is to seal the spent cartridge and to have the instrument ready for the next test.

The cartridge provides user simplicity. The cartridge benefits from the following features:

There is only one closure and this cannot be removed.

The first component, which is clear has a plurality of projecting fins on its side which give stability when loading the sample, and unsure correct orientation into the instrument and helps prevent fingerprinting the surface.

The filter is hidden, inaccessible and being totally enclosed is immune to violent shaking.

The liquids, their chambers and the filter slide surfaces are enclosed and are not easily contaminated.

In normal usage the user cannot unintentionally operate the cartridge until installed in the instrument.

In one embodiment the faces of the optical chambers can be curved.

The filter is fully aligned with the chamber apertures before air can enter. This means the product drops by gravity only when the chambers are fully aligned. The aim being fast emptying and agitation. The air tubes are positioned to allow this.

ran ran i aligi askab i siriginaj ji rita deptija datentak jiha, ka peptija i ranja, ji aktiva

The disposable cartridge has only a few parts.

-6-

The cartridge benefits from a non-return snap together assembly.

The cartridge benefits from reduced size compared to a carousel, and can be easily packaged in multiples.

The construction means the cartridge is fully sealed for after-use disposal.

The construction allows for a possible reduction in instrument size.

The invention will be now described, by way of example only, with reference to the following figures in which:

Fig. 1 is a perspective view of a cartridge of the invention.

Fig. 2 is an exploded view showing the component parts of the cartridge of Fig. 1;

Fig. 3 is a cross section through the cartridge of Fig. 1; and

Figs. 4 to 7 show cross-sections of the cartridge in an instrument at various stages during an assay procedure.

Referring to Figs. 1 to 3 the apparatus 10 of the invention takes the form of a cartridge. It comprises a first inlet 12, a second inlet 14 and an inlet port 16. The inlet port 16 comprises a filter 18 capable of retaining a binder retaining means.

The cartridge is constructed from a number of component parts. A first component part 20 is made of a clear material, for example, plastics, most preferably acrylic, and houses optical chambers 12 and 14. An additional chamber 13 is disposed between optical chambers 12 and 14 and functions as a wash chamber.

A second component 30 comprises two parts, a resilient component 40 and a cover 50.

· 第二元的第三章 2章 2章 3章 34、2章 35、章智 2章 35、章 35、章 35、章 35、章 35、章 35、章 36、章 36、55、章 36、55、章 36、55、章 36、55、章 36、章 36、5 The resilient component 40 comprises an elongate channel 42 (partially obscured) into which a third component 60 is slidably mounted. The third component comprises an inlet port 16 in which is housed a filter and/or binder retaining means 18 and a handle 64.

To construct the cartridge 10 the resilient component 40, which is made of rubber, is placed into cover 50. The rubber component 40 comprises three openings 44, 45, 46, which extend into the elongate channel 42. These openings, which are closed to form sample receiving chambers 24, 25, 26 by slide component 60, house various assay liquids. In the case of an assay for determining glycated and non-glycated proteins in haemoglobin the resulting sample receiving chambers 24, 25, and 26 contain respectively,

- 1) a buffer and an amino phenylboronate agarose matrix,
- 2) a wash buffer, and
- 3) an eluting buffer.

Extending and pivoting from one end of the rubber component 40 is a closure lid 47 which seals an aperture 52 in the cover 50 which leads into the filling chamber 24. At the side of each chamber 24, 25 and 26 is an air relief tube 48 which co-operates with an aperture (not shown) in the slide 60 such that when the inlet port 16 is correctly aligned with each chamber 24, 25 and 26 the aperture is aligned with the associated air relief tube thereby causing an air lock to break thus causing release of the chamber contents through the filter into the inlet there below. The component 40 further comprises a plurality of mating members 49 which allow it to be connected to component parts 20 and 50.

The first component comprises windows 72 and 74 which are inset from the main

· 医克里克氏病 医克克曼氏 医神经检查性检查性 医二种 医皮肤管 医线点 医皮肤皮肤 医皮肤皮肤 医

cartridge surface 76. By having the article windows inset and having projecting fins 78 on either side of the windows, fingerprints, can be avoided and the component strengthened. The second component 60 is preferably "I" shaped in cross section so that it can run against a number of surfaces ensuring a good sealing and preventing leakage from the respective chambers. It also has a handle 64 which can be held in a reading instrument; preferably on the track on which the cartridge runs.

The cover 50, has a toothed surface 54 which teeth provide a means by which the cartridge can be caused to move along a track 80 of a reading instrument.

To assemble and fill the cartridge the rubber component 40 is placed into the cover 50 and the plug closure 47 pivots to close aperture 52. The test liquids are then poured into the chambers 44, 45 and 46. The 3rd component slide 60, with filter 18 then slid into the channel 42 of the rubber component 40 thereby sealing the chamber 44, 45 and 46. The first component is then clipped into place thereby completing assembly.

The device is used in an assay as follows:

- 1) The cartridge is unpacked and the closure 47 opened.
- 2) A finger-prick blood sample is collected into a loop and placed into chamber 44 through aperture 52. The chamber comprises a buffer and an amino phenyl boronate (aPBA) agarose affinity matrix. The chamber is closed and the cartridge inverted several times, causing the red blood cells to be lysed thus liberating the haemoglobin.
- 3) The tube is left for approximately 60-90 seconds, with occasional inversion, during which the glycated haemoglobin present in the sample binds to the aPBA affinity

不知,我们就是一个数据,更有量的的要求。 "更有我们的,最终,要不知识的数据,是我们是<mark>是我的,我们没有的,他们也是</mark>是我们的

-9-

matrix.

- 4) During this time, the apparatus 10, which is designed to be disposable, is placed on the track 80 of an instrument which will read the samples and calculate and display the results (Fig. 4).
- 5) After about 60-90 seconds incubation, the inlet port 16 of the slide component is caused to move relative to the chambers 44, 45 and 46 and the corresponding chambers 12, 13, and 14. In fact the slide is held in position by locking handle 64 into a stop 82 on the track and the cartridge is caused to move along the track 80 by utilising the teeth 54 on the cover 50 to propel the cartridge.
- 6) When the inlet port 16 is aligned with the first inlet 12 and the first chamber 44 the first air relief tube 48 is caused to break releasing the contents of the first chamber 44 into contact with the filter 16. (Fig 5) The liquid contents of the chamber drain through the filter and are collected in the optical chamber 12. The aPBA affinity matrix, however, is too large to pass through the filter and therefore collects in the inlet port 16.
- 7) The liquid contents collect in the first optical chamber which contains the nonglycated haemoglobin present in the original sample, the aPBA affinity matrix collected in the inlet port 16 contains the glycated haemoglobin present in the original sample.
- 8) On completion of this first step, the instrument progresses to stage 2, which is accomplished by causing the cartridge to move along the track and stop at position 2 (Fig. 6). Again, under direction from the instrument the wash buffer from chamber 45 is released into chamber 13 via inlet port 16 and allowed to drain through. This step is to remove any

rango en la saglidada. La seglia del mesercia in producción del calante de la delegación de la completa de la guard

non-specifically bound non-glycated haemoglobin from the aPBA affinity matrix that may be present from step 1.

- 9) The instrument progresses to stage 3 and the contents of the chamber 46 is released into chamber 14 via inlet port 16. The elution buffer removes the glycated haemoglobin from the aPBA affinity matrix. (Fig. 7).
- 10) During the above the instrument spectrophotometrically measures the absorbance of both the non-glycated and the glycated haemoglobin fractions present in the two optical chambers. Using an algorithm built into the instruments software, the % glycated haemoglobin present in the original whole blood sample is calculated and displayed on the display.
- 11) The apparatus returns to its starting position, is disconnected from the instrument and is discarded as biohazardous waste. The instrument is then ready to perform the next test.

Whilst the invention has been described with reference to an assay for determining the % levels of glycated haemoglobin, the skilled man will appreciate that the number of inlets and chambers and the assay liquids will vary for other assay systems.

en propriété d'élique le mémor propégatif été mêtre montre met, été de tête desembles militérations de

- 11 -

CLAIMS

- 1. An apparatus 10, for use in an assay in which a sample is presented to an instrument, comprising a first inlet 12, a second inlet 14 and an inlet port 16, said inlet port being movable relative to each of said first and second inlets such that the inlet port can be brought into liquid communication with each inlet in turn as required, said inlet port accommodating a filter means or a binder retaining means 18 characterised in that said inlet port is brought into liquid communication with each inlet in turn along a linear path.
 - 2. An apparatus as claimed in claim 1 which is a cartridge.
- 3. An apparatus as claimed in claim 1 or 2 comprising a first component 20 including the at least first and second inlets 12,14, which are or include optical chambers; a second component 30 or components 40,50 comprising a sample receiving chamber 44 and at least one other chamber 46, said at least one other chamber containing an eluting medium; and a third component 60 comprising said inlet port 16.
- 4. An apparatus as claimed in claim 3 wherein said third component is slidably disposed below the sample receiving chamber in said second component and above the optical chambers in the first component.
- 5. An apparatus as claimed in claim 3 or 4 in which the third component seals the sample receiving chamber of the second component so that liquids stored or pre-loaded into the chamber are only released when the inlet ports formed therein are aligned with the optical chambers in the first component.
 - 6. An apparatus as claimed in claim 5 further comprising additional sealing means.

化环氯化物 医乳状畸胎 使性自动的 医环球菌 医动脉囊囊内部动脉 使用一个多类点法,这样的一种和全体的大大大大大大大大

- 7. An apparatus as claimed in any of claims 3 to 6 in which the third component is provided with a handle or other means by which it can be moved.
- 8. An apparatus as claimed in any of claims 3 to 7 in which the second component comprises a resilient component and a cover.
- 9. An apparatus as claimed in claim 8, in which the resilient component comprises a plug closure.
- 10. An apparatus as claimed in any of claims 3 to 9 in which the second component comprises a channel within which the third component slides.
- 11. An apparatus as claimed in any of the preceding claims further comprising locator lugs to ensure correct orientation in a measuring instrument.
- 12. An apparatus as claimed in any of claims 3 to 11 further comprising a plurality of fins projecting from the first component.
- 13. An apparatus as claimed in any of the preceding claims in which the optical chambers are curved.
- 14. An apparatus as claimed in any of the preceding claims comprising air relief tubes.
- 15. An apparatus as claimed in any of claims 3 to 14 wherein the first component is made of a clear material.
- 16. An apparatus as claimed in any of claims 3 to 15 in which the second component comprises two parts, a resilient component and a cover.
 - 17. An apparatus as claimed in any of claims 3 to 16 wherein the resilient

the record of the second of the control of the control of the second of the control of the contr

component comprises an elongate channel into which the third component is slidably mounted.

- 18. An apparatus as claimed in claim 14 wherein each air relief tube co-operates with an aperture in the slide such that when the inlet port is correctly aligned with each chamber the aperture is aligned with the associated air relief tube thereby causing an air lock to break thus causing release of the chamber contents through the filter into the inlet there below.
- 19. An apparatus as claimed in any of claims 3 to 18 wherein the first component comprises windows which are inset from the main apparatus surface.
- 20. An apparatus as claimed in any of claims 3 to 19 wherein the second component is "I" shaped in cross section.
- 21. An apparatus as claimed in any of the preceding claims wherein the apparatus has a toothed surface which teeth provide a means by which the apparatus can be caused to move along a track of a reading instrument.
- 22. An instrument for reading a sample presented in an apparatus, comprising a microprocessor operable via a key pad, one or more light emitters and one or more light detectors, a display and driver, an analogue to digital converter, and means for connecting the instrument to a power source, characterised in that the instrument comprises an elongate track adapted to bring an apparatus into a reading position.
- 23. An instrument as claimed in claim 22 further comprising a filter for selecting a suitable wavelength.

都可以大大大利用的Application (1965)。 1965年 1966年 196

it is a man as a man as a man as a man and a man and a man as a man as a man and a man

WO 00/76663 PCT/GB00/02251

- 14 -

24. A device comprising an apparatus as claimed in any of claims 1 to 21 and an instrument as claimed in claims 22 and 23.

The states of the first terminal Equation of the state of



(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization International Bureau



(43) International Publication Date 21 December 2000 (21.12.2000)

PCT

(10) International Publication Number WO 00/76663 A1

(51) International Patent Classification⁷: G01N 21/25, 35/02

B01L 3/00,

(21) International Application Number: PCT/GB00/02251

(22) International Filing Date: 9 June 2000 (09.06.2000)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

9913561.8

10 June 1999 (10.06.1999) GI

(71) Applicant (for all designated States except US): PROVALIS DIAGNOSTICS LIMITED [GB/GB]; Newtech Square, Deeside Industrial Park, Deeside, Flintshire CH5 2NT (GB).

(72) Inventors; and

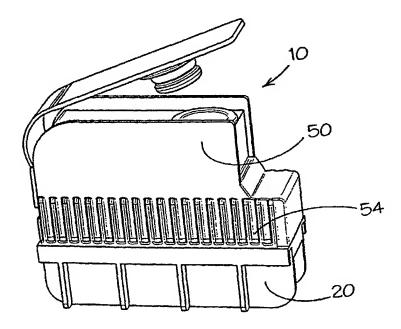
(75) Inventors/Applicants (for US only): ANDREWES,

David [GB/GB]; 5 Ridgeway Road, Farnham, Surrey GU9 8NN (GB). O'DELL, John, Anthony [GB/GB]; 24 Halford Road, Fulham, London SW6 1JT (GB). STEVENSON, Anthony [GB/GB]; 4 Beaumont Close, Chester CH4 8PT (GB). CURTIS, John [GB/GB]; Balderton House, Balderton, Chester CH4 9FL (GB). GRAY, Adrian, Richard [GB/GB]; West End House, Vaughans Lane, Chester CH3 5XF (GB). VESSEY, John, Philip [GB/GB]; Canna, Forest Road, East Horsley, Surrey KT24 5BT (GB). FERNANDO, Felix [GB/GB]; 24 Tudor Close, Wokingham, Berks RG40 2LU (GB). CRESWELL, Mark [GB/GB]; 11 Main Road, Broughton, Chester CH4 0NW (GB). PERCIVAL, David, Alan [GB/GB]; 4 Overlea Drive, Hawarden, Flintshire CH5 3HS (GB). ATTRIDGE, John, Worthington [GB/GB]; Oaksbridge, Send Marsh Road, Ripley, Surrey CH23 6JR (GB).

- (74) Agent: W.P. THOMPSON & CO.; Coopers Building, Church Street, Liverpool L1 3AB (GB).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE,

[Continued on next page]

(54) Title: APPARATUS, INSTRUMENT AND DEVICE FOR CONDUCTING AN ASSAY



(57) Abstract: The present invention relates to an apparatus, instrument and device for conducting an assay. The apparatus comprises a first inlet (12), a second inlet (14) and an inlet port (16) accommodating a filter or binder retaining means, wherein said inlet port is moveable relative to first and second inlets such that the inlet port can be brought into liquid communication with each inlet as required.



00/76663 A1



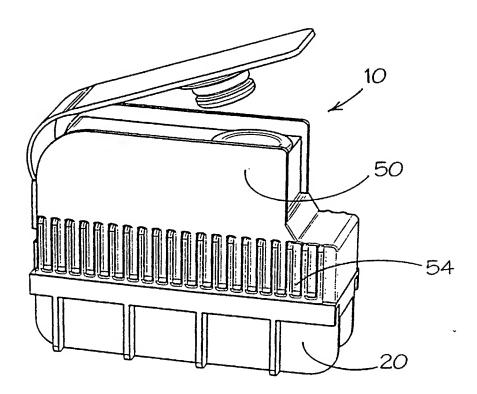
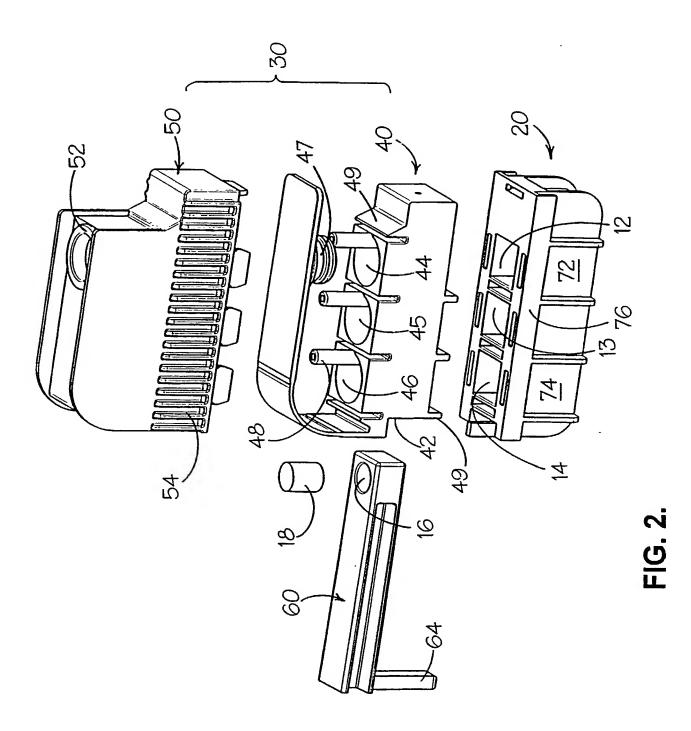


FIG. 1.

2/5



SUBSTITUTE SHEET (RULE 26)

PCT/GB00/02251

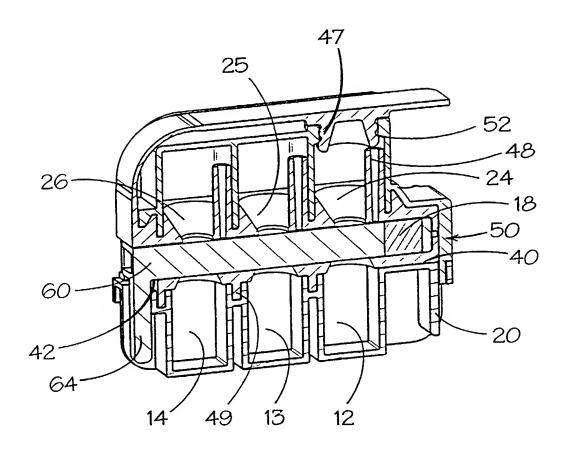
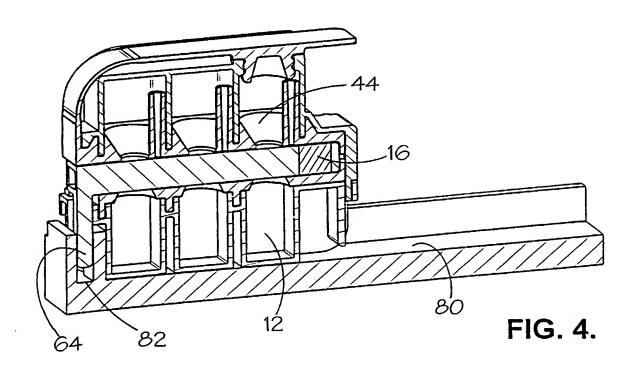
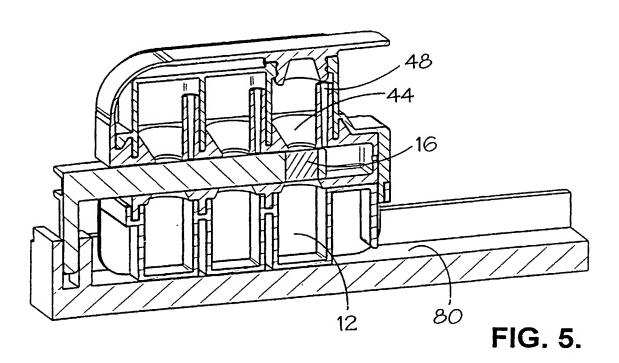


FIG. 3.

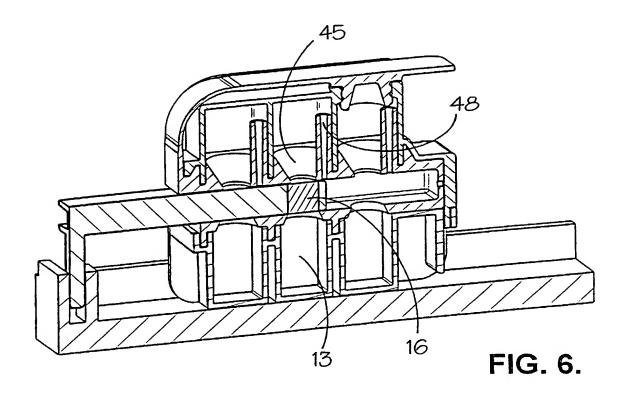
90/009678 PCT/GB00/02251

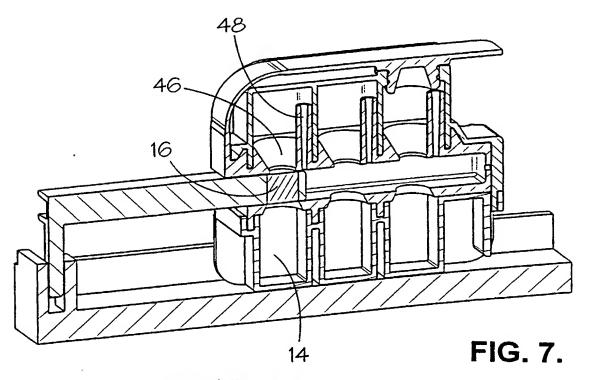




WO 00/76663







WPT0005

DECLARATION FOR

UTILITY OR DESIGN

1 010170	R DESIGN				
PATENT AP		First Named Invento	or Da	vid ANDRE	WES, et al.
(37 CF		CO	MPLETE II	KNOWN	
Declaration OR	Declaration to be	Application Number		10/009,	278
Submitted with Initial	Submitted after	Filing Date		December 7	
Filing	Initial Filing- eurcharge 37 CFK	Group Art Unit			
	1.16(e) required	Examiner Name			
As a below named inventor	or, I hereby declare that				
1					
My residence, post office					
I believe I am the original, (if plural names are listed i	first and sole inventor (if o	nly one name is listed be	low) or an o	riginal first and	l inint inventor
(if plural names are listed invention entitled:	oelow) of the subject matte	er which is claimed and fo	r which a pa	atent is sought	on the
8	APPARATUS INST	RUMENT AND DEV	ICE FOR		
		CTING AN ASSAY			ļ
the specification of which					
is attached hereto		•			
OR _		•			
☑ was filed on (MM/DD/YYYY)	12/07/2001	as U.S. Application No PCT International App	o, or		
and was amended on (MM/DD/YYYY)		(if applicable)		<u> </u>	
I hereby state that I have re claims, as amended by any	viewed and understand th		Luntidad and		
claims, as amended by any	amendment specifically n	eferred to above.	penuneo spe	ecincation, incit	liding the
I hereby claim foreign priori inventor's certificate, or § 30 the United States of Americ for patent or Inventor's certification on which priority	a, listed below and have a	application writing des	signated at i	east one count	ry other than
Prior Foreign Appl. No.(s)	Country F	oreign Filing Date Po	iority Not	Certified Copy	
PCT/GB00/02251	WIPO	(MM/DD/YYYY) (bemislO	Ycs —	Nu
9913561.8	GB	06/10/1999			⊠ ⊠
					

Additional foreign application nos, are listed on a supplemental priority data sheet PTO/SB/02B attached hereto; I hereby claim the benefit under 35 U.S.C. § 119(c) of any United States provisional application(s) listed below.

Filing Date (MM/DD/YYYY)

Attorney Dacket No.

Application Number(s)

DECLARATION – Utility or Design Patent Application

application of this provided by patentability	lesignatir s applica the first p as define	lion is not dis paragraph of	States of A closed in th 35 U.S.C. 1 1.55 which	merica, liste e prior Unite 12, I acknov became av:	ed belo ed Stote viedge ailable	w and, in: se or PC1 the duty !	sofar as the Finternation to disclose i	aubject r al applica	naller atlon ir an which	ational of each of the of the manner ch is material to pplication and		
U.S. P.	U.S. Parent Application or PCT Parent No. Parent Filing Date Parent Patent No. (MM/DD/YY) (if applicable)											
	☐ Additional U.S. or PCT international application rios. listed on P10/SB/028 attached hereto.											
transact all b Custome OR	usiness r Numbe	•	Trademark	Office conn	ected t	herewith;		cute this	applic	ation and to		
Rogistered practitioner(s) name/registration number listed below Registration Name Number Number												
	Name		NU	mbor		< -	Name		+	Number		
Addition	a) registe	red practition	er(s) name	on supplei	 nental	sheet RT	Ο/SB/02C a	ttached i	nereto			
		ence to: 🗵		umber \	2	5235	OR	Co		ndenec		
Name					/							
Address									-	•		
Address												
City						Stato		ZIP				
Country			Tolephone	•	Fax							
information a willful false s	and belief	all statement are bolieved s and the like statements n	l to be liue; s so made a	and further re punishab	that the	ese stater ne or imp	mente word xisonment, d	made with	th the l inder	knowledge that IB U.S.C. 1001		
Name of So							ınsigned inv					
G	iven Nah	o (first and i	iiddle [If an	/1)			Family No	me or S	umajii	E		
		David					ANI	DREWE	5_			
Inventor's Signature	•	<u>)</u>	Andr	ewes.				31		Date 4/6/		
Residence C	ity	Farnham	State	Surrey (G	B)	Country	lik	Citize	nship	UK		
Post Office A	Address	5 Ridgewa	ay Road .									
Post Office 4	ddress									ι		
City		Farnham	State	Surrey (GB)	ZIP	GU9 8NN	Coun	try .	ПK		
⊠ Additional	inventor	s are named	on <u>3</u> _sup	plemental a	dditlon	al invent	or(s) sheel(s) PTO/S	B/U2A	attached		

· ;: .

DECLARATION

ADDITIONAL INVENTOR(S) Supplemental Sheet Page 1 of 4

Nome of Additional Joint Inventor, if any:			7	☐ A petition has been filled for this unsigned inventor							
Giyen Name (first and middle [if any])				Camily Name or Surname							
John Worthington				ATTRIDGE							
Inventor's Signature			h	1.0	H.	i del	id		Date	12	15/02
Residence: City Ripley State				Surrey (GB) Codes UK			Ci	tizenahlp	ик		
Post Office Address Oaksbridge											
Post Office Address	Send Marsh	h Koa	d								
city	Ripley		State	Surrey (urrey (GB) ZIP CH23 6		6JR	JR Country		K	
Name of Additional J	oint Inventor, If an	y:	L	. ☐ A petition has been filed for this unsigned inventor							
Given Name (fir	st and middle lif any	/1)		Family Name or Surname							
J O Jah	n Philip			VESSEY							
inventor's Signature	450	Reso	7	7 Oal Date 14.06						26.02	
Residence; City	East Horsley	site	le s	urrey (GB)	esu	intry	UK	Citizer	nship		υK
Post Office Address	Canna								-		
Post Offica Address	Forest Road										
Спу	East Horsley	State	, Sn	rrey (GB)	ZIÞ	КТ2	4 5BT	Cut	untry		υK

DEC	ON	ADDITIONAL INVENTOR(S) Supplemental Sheet Page 2 of 4										
Name of Additional Jo any:		□ A potition has been filed for this unsigned inventu										
Given Name (first an	d middle [if any])		_		Family	Nan	ne or Suma	me				
4-W Felix	<u>.</u>		FFRNANDO									
Inventor's Signature	7	<u>ما</u>						Date	ท	7/02.		
Residence: Gity	Wokingham	State	Berks (G	≨ }}	Countr	¥	UK C	ıtızenship	UK			
Post Office Address	24 Fudor Clo	se										
Post Office Address												
City	Wokingham	State	Berks (0	B)	ZIP	R	G40 2LU	Country	U	к		
Name of Additional Jo any:	int inventor, if		☐ A petition has been filed for this unsigned inventor									
Given Name (first and	middle [if any])	. Family Name or Sumame										
5 Anthor	ıy		STEVENSON									
Inventor's Signature			Dale Date									
Realdence: City	Choster	State	Chester (C	3B)	Count	try	UK	Citizenship	u	K		
Pust Office Address	4 Beaumont	Close										
Post Office Address												
City	Chester	State	Chester (GB)		ZIP	CH	14 8PT	Country		uK		
Name of Additional Jo	int Inventor, if an	v:	☐ A petition has been filed for this unalgned inventor									
Given Name (first	and middle [if any])	Family Name ซา Sumame									
6-00 M	ork_		CRESSWELL									
inventor's Signature					$\sim \nu$	1.1	1	Date				
Residence: City	Broughton	State	Chester (C	B)	Count	ry	UK	Citizenal	nip	UK		
Post Office Address	11 Main Roa	d								* .		
Post Office Address							· · · · · ·					
City	Broughton	State	Chester (C	€D)	ZIP	C	H4 ONW	Count	Y.	UK		

DEC	ON	ADDITIONAL INVENTOR(S) Supplemental Sheet Page 3 of 4								
Name of Additional Joil any:		☐ A petition has been filed for this unsigned inventor								
bna ferif) ome/ noviO	middle [lf any])			Fa	mily Nan	ne or Sum	dine			
7 - (1) John					CU	RTIS				
Inventor's Signature				/ L	1			Date		
Residence, City	Balderton	State	Chester (G	B) C.	uhtry	uĸ	C	ltizenship	UK	
Post Office Address	Balderton H	ouse								
Post Office Address										
City	Balderton	State	Chester (I	3G)	ZIP	CH4 9	FL	Country	UK	
Name of Additional Joi any:	nt Inventor, if	☐ A petition has been filed for this unsigned inventor								
Given Name (first and fi	niddle [if any])	Family Name or Sumame								
David Ala	n	PERCIVAL								
Inventor's Signature			Date Date							
Residence: City	Hawarden	State	Flintshir	e (GB)	Coun	≖у ∪	K	Citizenship	UK	
Post Office Address	4 Overlea D	rive								
Post Office Address										
City	Hawarden	State	Flintshir	e (GB)	ŽI P	CH5 3F	IS	Country	UK	
Name of Additional Jo any:	int Inventor, if	A petition has been filed for this custigned inventor								
Given Name (first and	d middle (if any])	Family Name or Sumame								
John Ant	thony	O'DELL \								
/ Inventor's Signature	And	ton.	on oden 14-6-02 Date						2	
Residence: City	Balderton	State	London (0	3B)> C	ountry	UK	<u> </u>	Citizenship	UK	
Post Office Address	24 Halford	Road								
Cily	Fulham	State	London	(GB)	ZIP	SW6	1JT	Country	UK	

DECLARATION

ADDITIONAL INVENTOR(S)
Supplemental Sheet
Page 4 of 4

				or bec	o fluri fra	lluis umsia	ned inventor				
Jame of Additional Join any:	t Inventor, if	🗆 A petition has been flied for this unsigned inventor									
Given/Name (first and	middle [if any])	Family Name or Surname									
Adrian Ric			GRAY								
Inventor's			Date Date								
Signature Realdence: City	Vaughans Lane	State	1 - 42 //	ountry	UK	Citi	zenship	пк			
Post Office Address West End Hou		use									
Post Office Address								1			
City	Vaughans Lane	State	Chester (BG)	ZIP	CH	13 5XF	Country	uk			
Name of Additional Joany:	int Inventor, if	☐ A petition has been filed for this unsigned inventor									
Given Name (first an	d middle (if any))	Family Name or Surname									
·					<u>.</u>						
Inventor's Signature						_	Date				
Residence: City				Cour	ntry	CI	tlzenship				
Post Office Address			-								
Post Office Address				•							
City		State		ZIP			Country				

WPT0005

David ANDREWES, et al.

PATENT APPLICATION **COMPLETE IF KNOWN** (37 CFR 1.63) 10/009,278 Application Number □ Declaration to be Declaration OR December 7, 2001 Filing Date Submitted after Submitted Initial Filing-with Initial Group Art Unit surcharge 37 CFR Filing 1.16(e) required **Examiner Name** As a below named Inventor, I hereby declare that: My residence, post office address, and citizenship are as stated below next to my name. I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: APPARATUS INSTRUMENT AND DEVICE FOR **CONDUCTING AN ASSAY** the specification of which is attached hereto as U.S. Application No. or was filed on 12/07/2001 PCT International Application No. (MM/DD/YYYY) and was amended on (if applicable) (MM/DD/YYYY) I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above. I hereby claim foreign priority benefits under 35 U.S.C § 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed. Certified Copy Attached? Foreign Filing Date **Priority Not** Country Prior Foreign Appl. No.(s) Yes Claimed (MM/DD/YYYY) П \boxtimes **WIPO** 06/09/2000 PCT/GB00/02251 \boxtimes 06/10/1999 GB 9913561.8 ☐ Additional foreign application nos. are listed on a supplemental priority data sheet PTO/SB/02B attached hereto: I hereby claim the benefit under 35 U.S.C. § 119(e) of any United States provisional application(s) listed below. Filing Date (MM/DD/YYYY) Application Number(s)

Attorney Docket No.

First Named Inventor

DECLARATION FOR

UTILITY OR DESIGN

DECLARATION – Utility or Design Patent Application

I hereby claim the benefit under 35 U.S.C. 120 of any U.S. application(s) or 365(c) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of 35 U.S.C. 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56 which became available between the filing date of the prior application and												
the national of	or PCT inf	ternational fil blication or l	ing date of t	his applicati	on Par	ent Fili	ng C	Date	Pa	rent P	atent No.	
						(MM/DD)/YY)	(if app	licable)	
					,							
transact all b Custome OR	 ☐ Additional U.S. or PCT international application nos. listed on PTO/SB/02B attached hereto. As a named inventor, I hereby appoint the following registered practitioner(s) to prosecute this application and to transact all business in the Patent Trademark Office connected therewith: ☐ Customer Number OR ☐ Registered practitioner(s) name/registration number listed below 											
<u> </u>			Regis	stration							Registrat	
	Name		Nu	mber		• · · · ·	Na	me			Numbe	.1
Additional registered practitioner(s) named on supplemental sheet PTO/SB/02C attached hereto.												
Direct all cor		nce to: 🛛 (Customer N	umber	2:	5235		OR	☐ Cor	respor	ndence	
Name		0	r Bar Code	Label ^F	ATENT TR	ADEMARK (OFFICE	Ē	ado	dress b	elow	
										-		
Address												
Address									1			
City						State			ZIP			
Country			Telephone	•					Fax			
I hereby dec information a willful false s and such wil	and belief	are believed s and the like	I to be true; e so made a	and further re punishab	that the	se state ne or im	emer priso	nts were i onment, c	made wi or both, ເ	th the l inder 1	knowledge 18 U.S.C.	e that
Name of So	le or Firs	t Inventor:	☐ A pet	ition has be	en filed	for this				_		
G	iven Nam	e (first and n	niddle (if any	/])	-		F	amily Na			e	
		David						AND	DREWE	:S		 -
Inventor's Signature		Date										
Residence C	City	Farnham	State	Surrey (G	B)	Country	,	UK	Citize	enship	UK	
Post Office /	Address	5 Ridgew	ay Road .									
Post Office	Address										(
City		Farnham	State	Surrey (GB)	ZIP	Gl	J9 8NN	Cour	ntry	UK	
☑Additional inventors are named on 3 supplemental additional inventor(s) sheet(s) PTO/SB/02A attached												

[Page 2 of 2]

ADDITIONAL INVENTOR(S) Supplemental Sheet Page __1__ of __4__

Name of Additional Join	Name of Additional Joint Inventor, if any:		☐ A petition has been filed for this unsigned inventor								
Given Name (first	and middle [if any])			Fa	amily N	ame or S	Surnam	e		
John Wo	orthington			,		ΑΊ	TRIDO	E		-	
Inventor's Signature									Date		
Residence: City	Ripley	State	s	Surrey (GB)	Cou	ıntry	UK	Ci	tizenship	UK	
Post Office Address	Oaksbridge								<u>-</u>		
Post Office Address	Send Marsh	Road									
City	Ripley		State	Surrey (GB) ZIP CH23 6JR Countr						UK	
Name of Additional Joi	Name of Additional Joint Inventor, if any:				□Аре	etition h	nas been	filed fo	r this unsig	ned inventor	
Given Name (first	and middle [if any])		Family Name or Surname							
John	Philip			VESSEY							
Inventor's Signature			•					D	ate		
Residence: City	East Horsley	Sta	te S	Surrey (GB)	Cou	ntry	uĸ	Citize	enship	UK	
Post Office Address	Canna										
Post Office Address	Forest Road										
City	East Horsley	State	S	urrey (GB)	ZIP	кта	24 5BT	C	ountry	UK	

DEC	ADDITIONAL INVENTOR(S) Supplemental Sheet Page 2 of 4)		
Name of Additional Joi any:	nt Inventor, if			A pet	ition has	been	filed for th	is unsigned i	nvento	or .
Given Name (first and	middle [if any])				Family	Name	or Surnan	ne		
Felix					F	ERN	ANDO			
Inventor's Signature		,						Date		
Residence: City	Wokingham	State	Berks (G	в)	Country	/ (JK c	tizenship	UK	
Post Office Address	24 Tudor Clo	se		_		•				
Post Office Address	•									
City	Wokingham	State	Berks (GB)	ZIP	RG	640 2LU	Country	υĸ	
Name of Additional Jo any:	int Inventor, if			A petit	tion has	been	filed for thi	s unsigned ir	ventor	
Given Name (first and	middle [if any])				Family	Name	or Surnan	ne		
Anthor	2)			ST	EVE	NSON				
Inventor's Signature	× H	7	<i></i>					Date	103	04/02
Residence: City	Chester	State	Chester	(GB)	Count	try	UK	Citizenship	UK	
Post Office Address	4 Beaumont	Close								
Post Office Address										
City	Chester	State	Chester (GE	3)	ZIP	СН	4 8PT	Country		UK
Name of Additional Jo	int Inventor, if an	y:		[⊒ A petit	ion ha	as been file	d for this uns	signed	inventor
Given Name (first	and middle [if any])			Far	nıly N	ame or Su	rname		
м	ark					CRE	ESSWEL	L		
Inventor's Signature								Date		Ĭ,
Residence: City	Broughton	State	Chester	(GB)	Coun	try	uĸ	Citizensl	nip	uĸ
Post Office Address	11 Main Roa	d								
Post Office Address										
City	Broughton	State	Chester	(GB)	ZIP	CI	H4 0NW	Count	ry	UK

DEC	Ol	ADDITIONAL INVENTOR(S) Supplemental Sheet Page 3 of 4						5)				
Name of Additional Joi any:	nt Inventor, if] A pe	titior	has be	en	i filed for	this ur	nsigned invent	or
Given Name (first and	I middle [if any])			-		Fa	mily Na	me	or Surn	ame		
John	1						C	UF	RTIS			
Inventor's Signature											Date	
Residence: City	Balderton	Sta	te	Chester (G	в)	Co	untry		UK	С	itizenship	uĸ
Post Office Address	Balderton H	lous	se									
Post Office Address							_					
City	Balderton	Sta	ate	Chester (E	3G)		ZIP		CH4 9	FL	Country	UK
Name of Additional Jo any:	int Inventor, if	ventor, if ☐ A petition has been filed for this unsigned inventor										
Given Name (first and i	middle [if any])					Fam	ily Nam	те (or Surna	me		_
David Alan						_	PER	CI	IVAL			
Inventor's Signature					<u>-</u>		_				Date	
Residence: City	Hawarden	S	tate	Flintshire	e (GE	3)	Cour	ntr	y U	K (Citizenship	UK
Post Office Address	4 Overlea D	rive	е			- -						
Post Office Address												
City	Hawarden	5	State	Flintshir	e (Gi	3)	ZI P	(CH5 3H	s	Country	UK
Name of Additional Jo any:	int Inventor, if				□Ар	etitio	n has b	ee	n filed fo	r this u	ınsigned inver	tor
Given Name (first an	d middle [if any])					Fa	amily N	am	ne or Suri	name		
, John An	thony						C	ם'כ	DELL			(
Inventor's Signature		1									Date	
Residence: City	Balderton	St	ate	London (G	3B)	Co	ountry		υĸ	(Citizenship	UK
Post Office Address	24 Halford	Roa	ad									
City	Fulham	s	State London (GB) ZIP SW6 1JT Country UK							uĸ		

ADDITIONAL INVENTOR(S) Supplemental Sheet Page 4 of 4

Name of Additional Joi any:	nt Inventor, if	☐ A petition has been filed for this unsigned inventor									
Given Name (first and	d middle [if any])		F	amily N	lame o	or Surnam	e				
Adrian Ri	chard				GRA	Υ					
Inventor's Signature								Date			
Residence: City	Vaughans Lane	State Chester (GB) Country UK Citizenship UK									
Post Office Address	West End Ho	use									
Post Office Address											
City	Vaughans Lane	State Chester (BG) ZIP CH3 5XF .Country UK									
Name of Additional Jo any:	int Inventor, if	☐ A petition has been filed for this unsigned inventor									
Given Name (first and	f middle [if any])		F	amily N	lame o	or Surname	e	.,,-			
Inventor's Signature								Date			
Residence: City		State Country Citizenship									
Post Office Address											
Post Office Address											
City		State		ZIP			(Country			



ARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)

☐ Declaration Submitted with Initial Filing

OR Declaration to be Submitted after Initial Filing--surcharge 37 CFR 1.16(e) required

WPT0005 Attorney Docket No. David ANDREWES, et al. **First Named Inventor** COMPLETE IF KNOWN 10/009,278 **Application Number** December 7, 2001 Filing Date Group Art Unit **Examiner Name**

As a below named Inventor	, I hereby declare that:								
My residence, post office address, and citizenship are as stated below next to my name.									
I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:									
	APPARATUS INSTR	UMENT AND DE	VICE FOR						
		TING AN ASSAY							
the specification of which									
is attached hereto									
OR									
■ was filed on (MM/DD/YYYY)	12/07/2001	as U.S. Application PCT International A	n No. or Application No.						
and was amended on (MM/DD/YYYY)		(if applicable)							
I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.									
inventor's certificate, or §	rity benefits under 35 U.S.C 365(a) of any PCT internation ica, listed below and have a tificate, or of any PCT interr ty is claimed.	nal application which	ov checking the l	box, any fore e before that	ign application of the				
Prior Foreign Appl. No.(s		oreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Co Yes	py Attached? No				
PCT/GB00/02251	WIPO	06/09/2000			\boxtimes				
9913561.8	GB	06/10/1999			\boxtimes				
3313301.0									
☐ Additional foreign appl	ication nos. are listed on a s	supplemental priority	data sheet PTO	SB/02B attac	ched hereto:				
L haraba alaim the bonofit	under 35 U.S.C. § 119(e) o	f any United States p	rovisional applic	ation(s) listed	d below.				
Application Number(s)	Filing Date (MM/DD/YY	YY)							
, ipplication visiting in (e)	•								
	ſ								
	4								

DECLARATION – Utility or Design Patent Application

I hereby claim the benefit under 35 U.S.C. 120 of any U.S. application(s) or 365(c) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of 35 U.S.C. 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application												
U.S. Pa	rent App	lication or P	CT Parent	No.	Pa	rent Filin (MM/DD/			arent Pa (if appl	atent No. icable)		
☐ Additiona	IU.S. or I	PCT internati	onal applica	ation nos. li	sted or	PTO/SB	/02B attach	ed heret	0.			
transact all b Custome OR	As a named inventor, I hereby appoint the following registered practitioner(s) to prosecute this application and to transact all business in the Patent Trademark Office connected therewith: Customer Number								0			
		- \ <u>/</u>	Regis	tration			Mana			Registrati Numbe		
	Name		Nui	mber			Name			Numbe		
			-(-)	مامعینی می		about DT	OISBIO2C a	ttached	hereto			
		ed practition								ndence		
Direct all cor	Direct all correspondence to: Customer Number 25235 OR Correspondence or Bar Code Label PATENT TRADEMARK OFFICE address below											
Name												
Address												
Address								1				
City						State		ZIP				
Country			Telephone					Fax				
information a	and belief	all statements are believed s and the like statements m	to be true; so made a	and further re punisha	· that th ble bv f	ese statei ine or imp	ments were orisonment,	made w or both,	under 1	knowledge 18 U.S.C.	e that	
Name of So							unsigned in					
G	iven Nam	e (first and n	niddle [if any	/])			Family Na	ame or S	Surnam	e		
		David					AN	DREW	ES			
Inventor's Signature		Date										
Residence (City	Farnham	State	Surrey (GB)	Country	UK	Citiz	zenship	UK		
Post Office	Address	5 Ridgew	ay Road									
Post Office	Address											
City		Farnham	State	Surrey	(GB)	ZIP	GU9 8NN	Cou	ıntry	UK		
⊠Additiona												

[Page 2 of 2]



DECLARATION

ADDITIONAL INVENTOR(S) Supplemental Sheet Page __1__ of __4__

Name of Additional Jo	int Inventor, if any	:		☐ A petition has been filed for this unsigned inventor								
Given Name (first	and middle [ıf any])			Fa	amily N	lame or S	urnam	e			
John We	orthington			ATTRIDGE								
Inventor's Signature									Date			
Residence: City	Ripley	State	s	Surrey (GB)	Cor	intry	UK	Ci	tizenship	UK		
Post Office Address	Oaksbridge						-					
Post Office Address	Send Marsh	Road	d									
City	Ripley		State	tate Surrey (GB) ZIP CH23 6.					Country	UK		
Name of Additional Jo	oint Inventor, if any	<i>/</i> :			□ A pe	etition h	nas been	filed fo	r this unsig	ned inventor		
Given Name (firs	t and middle [if any])			F	amily N	Name or	Surnam	ie			
Johi	n Philip			VESSEY								
Inventor's Signature								Da	ate			
Residence: City	East Horsley	Sta	te S	Surrey (GB)	Cou	ntry	uĸ	Citize	enship	UK		
Post Office Address	Canna											
Post Office Address	Forest Road	Forest Road										
City	East Horsley	Stat	e S	urrey (GB)	ZIP	KT2	24 5BT	Co	ountry	UK		
					_							

DEC	N	ADDITIONAL INVENTOR(S) Supplemental Sheet Page 2 of 4 A petition has been filed for this unsigned inventor								
Name of Additional Join any:	nt Inventor, if			∃ A peti	tion has	been	i filed for th	is unsigned i	nvento	r
Given Name (first and	middle [if any])				Family	Name	or Surnar	ne		
Felix					FE	RN	ANDO			
Inventor's Signature								Date		
Residence: City	Wokingham	State	Berks (G	В)	Country	/	uk c	tizenship	UK	
Post Office Address	24 Tudor Clos	se								
Post Office Address										
City	Wokingham	State	Berks (GB)	ZIP	RG	340 2LU	Country	UK	
Name of Additional Joi any:	nt Inventor, if		☐ A petition has been filed for this unsigned inventor							
Given Name (first and	middle [if any])				Family	Name	e or Surnar	ne		
Anthony					ST	EVE	ENSON			
Inventor's Signature								Date		
Residence: City	Chester	State	Chester	(GB)	Coun	try	UK	Citizenship	UK	(
Post Office Address	4 Beaumont	Close								
Post Office Address									·	
City	Chester	State	Chester (G	В)	ZIP	СН	14 8PT	Country		UK
Name of Additional Jo	int Inventor, if an	y:		[⊒ A peti	tion h	as been fil	ed for this un	signed	inventor
Given Name (first	and middle [if any])			Fa	mily N	Name or Su	rname		
M	ark					CR	ESSWE	.L		
Inventor's Signature	h	R	N					Date		27/3/02
Residence: City	Broughton	on State Chester (GB) Country UK Citizenship					UK			
Post Office Address	11 Main Roa	11 Main Road								
Post Office Address										3
City	Broughton	State	Chester	(GB)	ZIP	C	H4 ONW	Coun	try	UK

Control of the control

DECLARATION Name of Additional Joint Inventor, if				ON ADDITIONAL INVENTOR(S) Supplemental Sheet Page 3 of 4							S)
Name of Additional Jo any:	int Inventor, if			□A	petiti	on has l	bee	n filed fo	r this	unsigned inver	ntor
Given Name (first an	d middle [if any])				F	amily N	lam	e or Sur	name		
Johi	n					(CUI	RTIS			
Inventor's Signature		1	6	Col.		·	,			Date	2830
Residence: City	Balderton	Sta	ate d	Chester (GB)	С	ountry		UK		UK	
Post Office Address	Balderton I	Hou	se						-		
Post Office Address											
City	Balderton	St	ate	Chester (BG)	ZIP		CH4 9	FL	Country	UK
Name of Additional Jo any:	int Inventor, if	nventor, if									
Given Name (first and	middle [if any])				Fai	mily Nar	me (or Surna	me		
David Al					PEF	RCI	IVAL	*			
Inventor's Signature	2	2	Dat					Date	28/3/02		
Residence: City	Hawarden	St	tate	Flintshire (0	B)	Cou	intry	y U	ĸ	Citizenship	UK
Post Office Address	4 Overlea D	Priv€	е								
Post Office Address											
City	Hawarden	s	State	Flintshire (0	€B)	ZI P	C	H5 3H	S	Country	UK
Name of Additional Jo any:	int Inventor, if			ΠA	petiti	on has t	seer	n filed fo	r this	unsigned inver	tor
Given Name (first and	d middle [if any])				F	amily N	lame	e or Surr	name	_	
John Ant	thony					C	ס'כ	ELL			
Inventor's Signature		Date									
Residence: City	Balderton	n State London (GB) Country UK Citizenship UK						UK			
Post Office Address	24 Halford	Roa	d								
City	Fulham	Sta	ate	London (GB)		ZIP		SW6 1	JT	Country	UK

Till 18 18 18 och state av det i det gjet i det statet statet for det i det en en en en skrivet i det en en en

1

DECLARATION

ADDITIONAL INVENTOR(S) Supplemental Sheet Page 4 of 4

Name of Additional Joi any:	nt Inventor, if		☐ A petition has been filed for this unsigned inventor									
Given Name (first and	d middle [if any])		F	amily N	Name (or Surnam	ie					
Adrian Ri	chard				GRA	ΑΥ						
Inventor's Signature								Date				
Residence: City	Vaughans Lane	State	Chester (GB)	Cour	ntry	UK	Citi	izenship	UK			
Post Office Address	West End Ho	Vest End House										
Post Office Address			"									
City	Vaughans Lane	State	State Chester (BG) ZIP CH3 5XF Country UK									
Name of Additional Jo any:	int Inventor, if		☐ A petitio	n has b	een fi	led for this	unsig	ned inventor				
Given Name (first and	I middle [if any])	Family Name or Surname										
									·			
Inventor's Signature		······································						Date				
Residence: City		State		Co	untry		Citi	zenship				
Post Office Address									. <u> </u>			
Post Office Address												
City		State ZIP Country										



DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)

Declaration Submitted with Initial Filing

OR Declaration to be Submitted after Initial Filing-surcharge 37 CFR 1.16(e) required

Attorney Docket No.	WPT0005
First Named Inventor	David ANDREWES, et al.
COMPL	ETE IF KNOWN
Application Number	10/009,278
Filing Date	December 7, 2001
Group Art Unit	
Examiner Name	A STATE OF THE PARTY OF THE PAR

As a below named Inventor, I hereby declare that:											
My residence, post office address, and citizenship are as stated below next to my name.											
I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:											
APPARATUS INSTRUMENT AND DEVICE FOR											
CONDUCTING AN ASSAY											
the specification of which	The state of the s										
is attached hereto											
OR											
★ was filed on (MM/DD/YYYY)											
and was amended on (MM/DD/YYYY)		(if applicable)									
	eviewed and understand the amendment specifically ref		ove identified spe	ecification, inc	cluding the						
I hereby claim foreign priority benefits under 35 U.S.C § 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed.											
Prior Foreign Appl. No.(s		oreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Co Yes	py Attached? No						
PCT/GB00/02251	WIPO	06/09/2000			\boxtimes						
9913561.8	GB	06/10/1999			\boxtimes						
<i>;</i> *					· 🔲						
Additional foreign applic	cation nos. are listed on a su	pplemental priority	data sheet PTO/	SB/02B attac	hed hereto:						
	ınder 35 U.S.C. § 119(e) of a										
Application Number(s)	Filing Date (MM/DD/YYY	Y)									

DECLARATION – Utility or Design Patent Application

I hereby claim the benefit under 35 U.S.C. 120 of any U.S. application(s) or 365(c) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of 35 U.S.C. 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application														
		rent Application or PCT Parent No.					Parent Filing Date (MM/DD/YY)				Parent Patent No. (if applicable)			
				(аррисаме				
Additional U.S. or PCT international application nos. listed on PTO/SB/02B attached hereto.														
As a named inventor, I hereby appoint the following registered practitioner(s) to prosecute this application and to transact all business in the Patent Trademark Office connected therewith: Customer Number OR Registered practitioner(s) name/registration number listed below														
			Regi	strat	ion							Registration		
	Name		NL	ımbe	<u>r</u>		_	N	ame				Numbe	ŗ
☐ Additiona	al register	ed practition	er(s) name	d on s	suppleme	ntal s	sheet P	ro/	SB/02C a	ttached	d hereto			
		ence to: 🛛 (lumb	er	25	5235 ADEMARK		OR		orrespo ddress	nd		
Name									· · · · · · · · · · · · · · · · · · ·					
Address														
Address														
City							State			ZIP				
Country			Telephon	е		Fax								
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and such willful false statements may jeopardize the validity of the application or any patent issued thereon.										that				
Name of So	le or Firs	t Inventor:	□Аре	tition	has been	filed	for this	un	signed inv	entor.				
G	iven Nam	ne (first and n	niddle [if an	y])					Family Na	me or	Surnam	ie		
wati		David							ANI	DREW	ES			
Inventor's Signature													Date	
Residence C	ity	Farnham	State	Sur	rey (GB	B) Country UK			Citi	zenship	,	UK		
Post Office A	Address	5 Ridgewa	ay Road		· · · · · · · · · · · · · · · · · · ·									
Post Office A	Office Address													
City		Farnham	State	Su	rrey (GE	3)	ZIP	G	U9 8NN	Co	untry	ι	JK	
Additional inventors are named on _3_supplemental additional inventor(s) sheet(s) PTO/SB/02A attached														

[Page 2 of 2]

ADDITIONAL INVENTOR(S) Supplemental Sheet Page 1 of 4

Name of Additional Joint Inventor, if any:			☐ A petition has been filed for this unsigned inventor										
Given Name (first and middle [if any])				Family Name or Surname									
John Worthington				ATTRIDGE									
Inventor's Signature									Date				
Residence: City	Ripley	State	s	urrey (GB)	Cou	untry	UK	Ci	Citizenship		UK		
Post Office Address	Oaksbridge												
Post Office Address	Send Marsh	Send Marsh Road											
City	Ripley	Ripley S			iB)	B) ZIP		6JR	JR Country		UK		
Name of Additional Jo	oint Inventor, if any	':	☐ A petition has been filed for this unsigned inventor										
Given Name (fire	st and middle [if any])	Family Name or Surname										
Joh	n Philip		VESSEY										
Inventor's Signature								Da	Date				
Residence: City	East Horsley	Stat	e S	Surrey (GB)	Cou	ntry	UK	Citize	enship		UK		
Post Office Address	Canna												
Post Office Address	Forest Road												
City	East Horsley	State	Şı	urrey (GB)	ZIP	кта	24 5BT	Co	ountry		UK		
				-									

a made that comorg

DECLARATION				ADDITIONAL INVENTOR(S) Supplemental Sheet Page 2 of 4							
Name of Additional Joir any:		☐ A petition has been filed for this unsigned inventor								г	
Given Name (first and	middle [if any])				Family I	Name	or Surn	ame			
Felix					FE	RN.	ANDO				
Inventor's Signature			Date					Date			
Residence: City	Wokingham	State	Berks (G	В)	Country	/ u	JK	Citi	zenship	UK	
Post Office Address	24 Tudor Clos	se									
Post Office Address											
City	Wokingham	State	Berks (GB)	ZIP	RG	40 2Ll	J	Country	υк	
Name of Additional Joi any:	nt Inventor, if		☐ A petition has been filed for this unsigned inventor								
Given Name (first and	middle [if any])		Family Name or Surname								
Anthor	nthony STEVENSON										
Inventor's Signature							-		Date		
Residence: City	Chester	State	Chester	(GB)	Count	try	UK	C	itizenship	UK	
Post Office Address	4 Beaumont	Close									
Post Office Address											
City	Chester	State	Chester (GI	В)	ZIP	СН	4 8PT		Country		UK
Name of Additional Jo	int Inventor. if any	r:	☐ A petition has been filed for this unsigned inventor								inventor
Given Name (first	and middle [if any])	Family Name or Surname								
М		CRESSWELL									
Inventor's Signature									Date		(
Residence: City	Broughton	State	Chester	(GB)	GB) Country UK			Citizens	hip	uĸ	
Post Office Address	11 Main Roa	d		•							
Post Office Address											
City	Broughton	State	Chester	(GB)	ZIP	С	H4 0N\	N	Count	ry	uĸ

DEC	ADDITIONAL INVENTOR(S) Supplemental Sheet Page 3 of 4										
Name of Additional Joir any:	nt Inventor, if	☐ A petition has been filed for this unsigned inventor									
Given Name (first and	middle [if any])		Family Name or Surname								
John			,		Cl	JRTIS					
Inventor's Signature				1				Date			
Residence: City	Balderton	State	Chester (GB)	Cot	untry	UK	С	itizenship	UK		
Post Office Address	Balderton Ho	ouse									
Post Office Address											
City	Balderton	State	Chester (BG)		ZIP	CH4	FL	Country	UK		
Name of Additional Joi any:	nt Inventor, if	□ A petition has been filed for this unsigned inventor									
Given Name (first and r	niddle [if any])	Family Name or Surname									
David Ala	an	PERCIVAL									
Inventor's Signature								Date			
Residence: City	Hawarden	State	Flintshire (G	B)) Country U			Citizenship	UK		
Post Office Address	4 Overlea D	rive									
Post Office Address		.=.			-						
City	Hawarden	Stat	e Flintshire (C	e (GB) ZI CH5 3H			HS	Country	UK		
Name of Additional Jo any:	int Inventor, if	☐ A petition has been filed for this unsigned inventor									
Given Name (first an	d middle [if any])) Family Name or Surname									
. John An	O'DELL (
Inventor's Signature	,							Date			
Residence: City	Balderton	State	London (GB)	C	ountry	uĸ		Citizenship	UK		
Post Office Address	e Address 24 Halford Road										
City	Fulham	State	London (GB)	ZIP	swe	1JT	Country	UK		

ADDITIONAL INVENTOR(S) Supplemental Sheet Page 4 of 4

Name of Additional Joi any:	☐ A petition has been filed for this unsigned inventor										
Given Name (first and	Family Name or Surname										
Adrian Ri	chard	GRAY									
Inventor's Signature		PA						Date	24)4402		
Residence: City	Vaughans Lane	State	Chester (GB)	Coun	try	UK	Citi	zenship	UK		
Post Office Address	West End Ho	West End House									
Post Office Address											
City	Vaughans Lane	State	Chester (BG)	z	(IP	CH3 5	CH3 5XF Country				
Name of Additional Jo any:	int Inventor, if	☐ A petition has been filed for this unsigned inventor									
Given Name (first and	d middle [if any])	Family Name or Surname									
	-			_							
Inventor's Signature								Date			
Residence: City		State		Cou	Country			izenship			
Post Office Address											
Post Office Address			y								
City		State	State ZIP								